

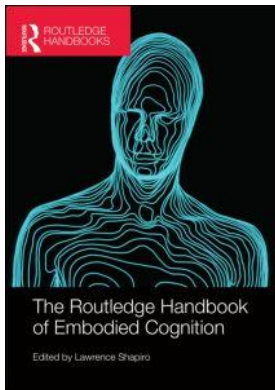
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PART I

Historical underpinnings

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1

PHENOMENOLOGY AND EMBODIED COGNITION

Shaun Gallagher

As this volume makes clear, research on embodied cognition draws from a number of disciplines and is supported by a variety of methodological strategies. In this chapter I focus on what phenomenology has contributed to our understanding of embodied cognition. I take “phenomenology” to mean the philosophical tradition initiated in the twentieth century by Edmund Husserl and developed by a variety of philosophers, including Martin Heidegger, Maurice Merleau-Ponty, Jean-Paul Sartre, Aron Gurwitsch, and numerous others. More recently phenomenologists following this tradition have been drawn into theoretical and empirical research in the cognitive sciences, and especially into discussions of enactive and embodied conceptions of the mind (e.g. Dreyfus, 1973, 2002; Gallagher, 2005; Gallagher and Zahavi, 2012; Thompson, 2007; Varela, Thompson, and Rosch, 1991). I’ll start by looking at some of the historical resources that define the phenomenology of the body. I’ll then consider how phenomenology, as a methodology, relates to scientific investigations of embodied cognition, and finally go on to identify some of the insights about embodied cognition that phenomenology provides.

Historical resources

An analysis of embodied aspects of perception and cognition can be found in Husserl’s early work. Husserl (1997) writes about the role of kinesthesia (movement sense) in perception. For example, since extraocular motor processes help to control where we look, kinesthetic feedback from that movement correlates with perception in the visual field. Extraocular processes, however, are embedded in a motor system that controls head movement, and general body posture. Accordingly, kinesthetic patterns more generally are activated in correlation with visual perception. More than that, visual objects activate the kinesthetic system in such a way that the positions and shapes of the objects are “con-figured” with potential bodily movements. This kind of analysis broadly prefigures the contemporary neuroscience of the pragmatic and affective resonance that occurs in our motor systems when we perceive objects within our manipulable area (instantiated in the activation of canonical and mirror neurons – see Rizzolatti *et al.*, 1988; Rizzolatti, Fadiga, Gallese, and Fogassi, 1996).

Husserl continues this analysis in several of his writings, but especially in *Ideas II* (1913/1989). There he develops the important phenomenological distinction between *Körper*, variously translated as the objective body or the body-as-object, and *Leib*, the lived body or body-as-subject.

In regard to the body-as-object we may distinguish between how the body is conceived by different kinds of knowledge – for example, objective and scientific knowledge – that one might have of the body, and more immediate experiences of the body when, for example, we reflectively focus on some body part. These different aspects of the body-as-object are included in what some theorists call the (long-term and short-term) body image (O’Shaughnessy, 1995) which encompasses perceptual, affective, and conceptual dimensions. In contrast, the body-as-subject refers to the perceiving (or experiencing) body, the agentive body that moves in action, where most of the experiencing is pre-reflective. In this regard, as I perceive the world around me, or as I engage in action, I do not experience my body as one object among others in the environment. At the same time I am not completely unaware of my position or my movement. In this notion of pre-reflective awareness of bodily position and movement (based not only on proprioceptive and kinesthetic processes, but also visual and tactile information) we have a prefiguring of Gibson’s (1979) notion of ecological perception. That is, when I perceive the world I also have an implicit awareness of my own position, posture, and movement.

Likewise, in Husserl’s notion of the “I can” we find a prefiguring of Gibson’s notion of affordances, and an enactive approach to perception. Husserl contends that as I perceive the objects around me, I perceive them in terms of the possibilities I have to interact with them. I see *X* not in purely objective or recognitional terms as the object *X*; rather I see it as something *I can* grab, or eat, or throw, or sit upon. These action possibilities are not cognitive additions to perception but are implicit in the way that I perceive the object – that is, implicit in the intentional structure of perception.

From these kinds of analyses we can see that, for Husserl, embodied aspects of experience permeate perception. Husserl’s analyses of the intentionality of other cognitive acts, such as memory and imagination, however, also show the relevance of these embodied aspects. Thus, in his analysis of memory, he suggests that episodic memory involves a re-enactment of past perception, which includes the original intentional structure of that perception, and thus the various bodily aspects implicit in that structure. Remembering my past actions, for example, involves a making present again, although in a modified sense (Husserl uses the term *Vergegenwärtigung*), of perceptual experience. Again we can note the consistency between this phenomenological account and contemporary scientific accounts of memory (see e.g. Schacter *et al.*, 1996).

Merleau-Ponty picks up where Husserl left off. Merleau-Ponty, however, was also influenced by Heidegger, and by his own readings in developmental psychology, psychiatry, and neurology. Heidegger (1962) has little to say about the body *per se*, but he does provide an influential account of a particular way of being-in-the-world that is implicitly embodied. His notion of the ready-to-hand (*Zuhanden*) involves a pragmatic conception of our ordinary stance towards the world. Not unlike Husserl’s notion of the *I can* or Gibson’s later notion of *affordance*, Heidegger pictures our human existence (*Dasein*) as pragmatically involved in tasks where tools are incorporated into our action intentionalities – experientially transparent extensions of our bodies as we engage in the world. This analysis figures prominently in Hubert Dreyfus’s work on embodied coping and expertise (Dreyfus, 2000).¹

Of all the phenomenologists, however, Merleau-Ponty is best known as the philosopher of embodiment. He was able to integrate his study of psychology and neurology into his phenomenology of perception where the notions of lived body and body schema play a central role. For Merleau-Ponty (2012) the body is the perceiver, and perception involves both sensory and motor processes. He provides an analysis of kinesthesia, phantom limbs, and other such topics by drawing heavily and with a critical eye on the neuroscience/neurology and psychology of his time. In a central chapter of his *Phenomenology of Perception*, he introduces the concept of the body schema, which he takes from the work of Henry Head, and then famously uses the

pathological case of Schneider to rework the concept. He distinguishes the spatiality of the surrounding environment from the spatiality of the body, organized in a proprioceptive order where my hand is not next to me in the same way that the cup is next to me. “My entire body is not for me an assemblage of organs juxtaposed in space. I hold my body as an indivisible possession and I know the position of each of my limbs through a body schema [*un schéma corporel*] that envelops them all” (Merleau-Ponty, 2012, pp. 100–1). The body schema is ambiguous since it is activated when I engage in intentional action but also seems to operate on its own in a way that is not explicitly under my control. The body schema is not something produced by an association of partial images or sensations, but a whole which governs the parts – it’s the law or principle of movement rather than the immediate product of movement. It dynamically organizes bodily movement in terms of the organism’s projects – or the subject’s actual or possible tasks. The spatiality of the body, then, is not an objective spatiality measurable by a ruler, but a “spatiality of situation” in which the body and the world form a practical system (ibid.).

A patient of Gelb and Goldstein, Schneider, who suffered extensive brain damage from a war wound, is unable to follow a specific instruction to move in a certain way. He is not able to flex his arm if he is commanded to do so, for example. Yet he is able to move in a voluntary way to accomplish everyday goals and work actions. He has a problem with what Goldstein called “abstract” movement, but not with “concrete” movement. His body-schematic control of a contextualized action works without a problem; but his attempt to move to order involves him attending to the body as an object and organizing it into a position defined in the axes and coordinates of objective space. One thing Merleau-Ponty’s long and detailed analysis of this complex case shows is that subjects without Schneider’s problems are able to deal with possible action, and not just action that is driven or elicited by the concrete environment – although this too is extremely important for many of our actions.

Merleau-Ponty takes over Goldstein’s (1971) distinction between grasping (which is “concrete”) and pointing (which is “abstract”/categorical). These distinctions remain somewhat ambiguous, however, so that even normal grasping capacity may require the categorical attitude (Goldstein, 1971, pp. 279–80). Despite this ambiguity, the distinction between grasping and pointing has been taken by some phenomenologists to mean that concrete behavior (e.g. grasping) is more basic (it survives certain pathologies where pointing does not), and that it characterizes our normal motor intentionality in its non-representational, non-conceptual form (e.g. Kelly, 2000, 2004). In pathological cases, like Schneider, for example, these two capacities can come apart. There are several important qualifications to be made here, however. First, the extent of Schneider’s brain damage remains unclear, so we have an incomplete picture of his pathologies (see Jensen, 2009). Second, we need to carefully distinguish between normal functions that manifest themselves more clearly in pathological cases, and functions that emerge as compensatory within the pathology (Marcel, 2003). Kelly assumes that Schneider’s intact concrete capacities are normal, but this may be unwarranted. Finally, there are various kinds of pointing: non-communicative pointing (touching *X* in an experimental situation); communicative (deictic) pointing; imperative pointing (to something I want); and declarative pointing (to call another’s attention to something). Moreover, in different pathologies communicative pointing and gestures may be intact when concrete grasping and non-communicative pointing are impaired (see e.g. Cole, Gallagher, and McNeill, 2002).

Jean-Paul Sartre (1956) introduced a different consideration by distinguishing between the body-for-itself (that is, the body-as-subject) and the body-for-others. This integrates an important dimension of intersubjectivity into the analysis of the body. In this regard, Merleau-Ponty emphasized the notion of intercorporeity – a kind of intertwining of two embodied subjects in perceptual and interactive contact, a concept that supports more recent discussions of interaction

in social cognition (e.g. De Jaegher, Di Paolo, and Gallagher, 2010). For Merleau-Ponty, “other minds are given to us only as incarnate, as belonging to faces and gestures” (1964, p. 16). For Sartre, however, the body-for-others is first of all an observed object – it falls under the gaze of the other person and in most cases is objectified or reified. The other sees me first as an object, and this defines the initial encounter that I then have to work through in my intersubjective dealings with that other. Importantly, this adds a certain dimension to the subject’s experience of her own body. Not only is my body seen by the other; it is experienced by me as seen by the other. This initiates an exterior perspective that I have on myself, and contributes to the constitution of an objective self.

Phenomenology in science

In scientific contexts the concept of phenomenology is not usually taken in the strict or formal sense defined by the philosophical phenomenological tradition. In this less formal sense, phenomenology still has an important role to play in studies of embodied cognition and bodily action. In this context, one might think that phenomenology, on its own, is limited to an analysis of the consciousness of the body (the way that we are aware of the body) since strictly speaking phenomenology is not able to penetrate beyond our experience of how things seem to us – the way the world appears, or the way one’s body appears in consciousness. While phenomenology can certainly provide this kind of analysis, it can also go beyond it in at least two ways.

First, in the phenomenological analysis of action, for example, I can discover, in a negative way, what I either *do not* or *cannot* experience. For example, when I reach to grasp a cup I am not aware of the precise shaping of my grasp, which, on the basis of certain subpersonal processes and my pragmatic relation to the particular object in the environment, is different from the detailed shape of my grasp when the object is much smaller or much larger, or shaped differently, or positioned differently, etc. This shaping of the grasp happens in a non-conscious way. Although I am not aware of how this shaping of grasp takes place, and usually am not even aware of the precise details of my finger positions as I grasp, I can discover this lack of awareness phenomenologically in reflection. That is, I can discover that I am not aware of the shaping of my grasp in the normal course of such action. More generally, in this negative way, I can reflect on elements of body-schematic motor control and affective factors that remain non-conscious and that modulate perception, attention, and action.

One might argue that behavioral studies can already tell us this. But in some important way this kind of negative phenomenology is an initial part of any behavioral study of this sort. If, for example, a scientist were studying for the very first time the simple action of reaching to grasp something, it would be important to know what the agent is conscious of during the action. Is the agent entirely unconscious of everything pertaining to the action; or is the agent entirely conscious of all aspects of her movement? When the agent reports that she is or is not conscious of a particular aspect of the action (if indeed she is asked) she is giving a phenomenological report (and with some training she may be better able to say what she is or is not conscious of). If the agent is not asked to provide such a report, there is likely some implicit or explicit assumption made by the behavioral scientist based on her own experience, or on previous empirical knowledge about how such things work. Even in the latter case, there is still some phenomenological fact of the matter, established in previous work and likely built into the design of the experiment. More generally, questions about what a subject is conscious of or not conscious of, what they know or don’t know about the experiment, whether they are focused or not focused on what they are asked to focus on, etc., are important ones in many behavioral experiments.

Second, even if many of the effects of bodily processes on cognition happen on the sub-personal or neuronal level, phenomenology can still be relevant to working out a causal explanation. Since the investigation of subpersonal processes is often meant to be explanatory for cognitive operations that also have a person-level dimension – assuming that remembering, imagining, deciding, solving problems, dreaming, etc., are in some regards part of a person's conscious experience – it seems important to understand the nature of the person-level explanandum to even know what type of subpersonal processes to look for, or how such processes can be explanatory. Without the phenomenology, in fact, neuroscience would be hard pressed to know what to look for; it would be working in the dark.

Consider the study of phantom limbs. Whether the neuroscientist discovers a neuromatrix involved in the phenomenal presence of the limb (Melzack, 1990), or that neural plasticity is responsible for phantom pain, such explanations would make no sense at all without some reference to the subject's experience. Likewise for any number of pathological or experimentally induced phenomena – somatoparaphrenia, anarchic hand syndrome, delusions of control, rubber-hand illusion, whole-body displacement, the Pinocchio effect, etc.

To be clear, there is not necessarily a one-to-one correlation between the phenomenology and specific brain processes. But cognition researchers are able to point to specific activated brain areas only in reference to person-level phenomena. To put this more strongly, it is not only that what happens on a phenomenologically accessible personal level can give us some clue to what may be happening on the subpersonal level, but that it may count as part of the explanation of subpersonal processes. The explanation has to go at least two ways: bottom-up and top-down. A cognitive neuroscientist who explains that neurons in area F5 are activated, must give some indication of what this activation correlates with on the personal level of experience or behavior. In regard to cognitive neuroscientific methodology, if subjects are not in a specific personal-level situation (e.g. engaged in an intentional action, or watching another person engage in an intentional action) there is no expectation that specific neurons in area F5 will activate. Neuroscientists thus need to appeal to personal-level practices and phenomenological experiences in setting up their experiments, and in many cases the only way to define the explanandum is in terms of phenomenology. In any particular case, if the neuroscientist is investigating brain processes that correlate with *X* (on an experiential or behavioral level) she cannot simply depend on a wild guess about what the experience of *X* is or what behavioral situations might elicit it.

What does phenomenology tell us about embodied cognition?

Numerous phenomenologists have indicated that there is a sense of “mineness” or “ipseity” built into every experience. This is sometimes called the sense of ownership (SO), where ownership means not some external relation of *having* something (as in ownership of property), but signifies the intrinsic “ownness” or mineness of experience, an aspect of the experience that makes it subjectively *my* experience. SO, as such, holds not only with regard to experiences of my body or my body parts, e.g. when I reach and grasp something, the sense that it is *my* arm that is reaching and *my* hand that is grasping, but also in regard to my experiences of self-movement and action – SO not only for my arm, but also for my action. SO is directly tied to the phenomenological idea of pre-reflective self-awareness, i.e. when we consciously think, or perceive, or act, we are pre-reflectively aware that we are doing so, and this pre-reflective awareness is something built into experience itself, part of the concurrent structure of any conscious process.

Pre-reflective self-awareness, however, also involves a sense of agency (SA), which is conceptually distinct from SO (Gallagher, 2000). SA can be defined as the pre-reflective experience

that I am the one who is causing or generating a movement or action. The phenomenological distinction between SA and SO can be easily understood in the experience of involuntary movement. If someone pushes me from behind, I experience the initial movement as something happening to me, as something that I am experiencing, and so have an experience of ownership for the movement. I do not claim that it is someone else who is moving, since I have an immediate sense that I am the one moving. At the same time, however, I can say that I have no experience of self-agency for this movement. I did not cause it; someone else pushed me. So in the case of involuntary movement (as well as in reflex movement) SA and SO come apart. In the case of voluntary action, on the other hand, they seem tightly fitted and indistinguishable in pre-reflective experience.

Neuropsychologists have found this distinction useful for clarifying their studies of agency and perceptual illusions, for example, the rubber-hand illusion. Experimenters have tried to identify the neural correlates for SA. Let's think again about involuntary movement. In the case of involuntary movement there is SO for the movement but no SA. The neuroscience suggests that awareness of my involuntary movement is generated in refferent sensory feedback (visual and proprioceptive/kinesthetic information that tells me that I'm moving). In the case of involuntary movement there are no initial motor commands (no efferent signals). Thus, it seems possible that in both involuntary and voluntary movement SO is generated by sensory feedback, and that in the case of voluntary movement SA is generated by efferent signals (Tsakiris and Haggard, 2005; Tsakiris, 2005)

On this view SA is conceived as generated in motor-control-related brain processes. But this may not be the whole story. SA, in addition to involving a sense of controlled embodied movement, involves a sense of controlling events in the external world. We can therefore distinguish between an experience of agency generated in motor control processes, and an experience of agency associated with perceptual monitoring of what one actually accomplishes by the action. Both of these aspects, the *motor control aspect* (the sense that I am causing or controlling my bodily movement, linked to efferent processes) and the *intentional aspect* (what gets accomplished, or fails to get accomplished, by the action, provided by perception), enter into SA. As Haggard (2005) shows, there is a confirmatory consistency between the neuroscience and the phenomenology. That is, phenomenologically one can make the same distinctions between SA taken as a sense of bodily control, and SA taken as a sense of controlling what one accomplishes in the world (Gallagher, 2007).

This distinction, however, has been confused in experimental literature. For example, in an fMRI experiment conducted by Farrer and Frith (2002), and designed to find the neural correlates of SA, subjects are asked to manipulate a joystick to drive a colored circle moving on a screen to specific locations on the screen. In some instances the subject causes this movement and in others the experimenter or computer does. The subject is asked to discriminate self-agency (when they feel they are in charge of the movement) and other-agency (when they feel the other person is in charge of the movement). Citing the distinction between SA and SO, Farrer and Frith associate SA with the intentional aspect of action, i.e. whether I am having some kind of effect with respect to the goal or intentional task (or what happens on the screen). Accordingly, they claim that SO ("my hand is moving the joystick") remains constant while SA (based on the intentional aspect) changes. When subjects feel that they are not controlling the events on the screen, there is activation in the right inferior parietal cortex and supposedly no SA for the intentional aspect of the action. When the subject does have SA for the action on the screen, the anterior insula is activated bilaterally.

Although Farrer and Frith clearly think of SA as something tied to the intentional aspect of action and not to mere bodily movement or motor control, when it comes to *explaining why*

the anterior insula should be involved in generating SA, they frame the explanation entirely in terms of motor control. In the protocol of the experiment, and then in the explanation of the results, the distinction between the two aspects of SA (motor control aspect and intentional aspect) gets lost. In such a case, phenomenology can be put to good use. Closer attention to the phenomenology of agency could help to clarify the distinction between the intentional aspect and the motor aspect of agency, a distinction that can easily get confused in the neurological explanation.

Phenomenologists can also show that there is more to SA than the pre-reflective elements delineated here. In actions that involve reflective deliberation or retrospective evaluation, these more reflective aspects of action, which may also bring into play social norms and forces that are not reducible to processes confined to individual brains, may enter into the experience of agency (Gallagher, 2010). In this regard, phenomenology tends to support a non-reductionist approach to the naturalistic study of human agency, and to regard SA as complex, involving both pre-reflective and reflective aspects.

How much detail can phenomenology explicate within the pre-reflective SA? One might be able to make legitimate conceptual or theoretical distinctions between “awareness of a goal, awareness of an intention to act, awareness of initiation of action, awareness of movements, sense of activity, sense of mental effort, sense of physical effort, sense of control, experience of authorship, experience of intentionality, experience of purposiveness, experience of freedom, and experience of mental causation” (Pacherie, 2007, p. 6). The question is whether all of these distinctions show up as such in the actual first-order phenomenology. Might they not be the product of theoretical reflection on the first-order phenomenology? As I engage in action I may not experience a difference between my sense of effort and my sense of control, although I can certainly make that distinction in my reflective (retrospective) consideration of my action. The distinctions may show up clearly at the level of my retrospective attribution, but may be entirely lost in my immersed and pre-reflective SA. My awareness of *what* I am doing and *that* I am doing it is usually struck at the most pragmatic level of description (“I’m getting a drink”) rather than at a level that distinguishes between the action and my agency, or within the action between the goal and the means, or within agency between intentional causation, initiation, and control.

Considerations about SO and SA enter into a phenomenological analysis of self-consciousness – specifically, a minimal, pre-reflective embodied self-consciousness that is more basic than reflective, conceptual aspects of self-consciousness. This basic self-awareness is nonetheless complex since it involves distinctions between self and non-self, as well as SO and SA; but it is also fragile since aspects of SO and SA may be disrupted or deleted in certain pathologies or experimental situations. The complex pre-reflective SA may disappear or be disrupted in delusions of control, or conditions such as anarchic hand syndrome, where one hand seems to do intentional actions that are not under the subject’s control. Likewise, SO may be modulated or may disappear for specific actions or limbs, as in somatoparaphrenia following stroke (where a patient may claim that her left arm does not belong to her), or in experiments such as the rubber-hand illusion, where certain visual and tactile stimulations can lead to the feeling that a rubber hand is actually part of one’s body.

As Sartre indicated, however, phenomenology can tell us something not just about one’s own body and self-consciousness, but can also contribute to an account of embodied social cognition. In Sartre’s terms, the body is not only *for me*, it is also *for others*. Following certain aspects of Husserl’s and Merleau-Ponty’s analysis, one can develop the notion of “intercorporeity” as the basis of an embodied account of intersubjective interaction that is highly consistent with both developmental science and recent discoveries in social neuroscience. In this

respect one can point to aspects of embodied and enactive perception of the other's movements, postures, facial expressions, gestures, and actions that contribute to an underpinning of our understanding of others in the rich emotional, social, and pragmatic contexts of everyday life. Our capacities for joint attention and joint action are bodily capacities that develop early in infancy. We learn to move in certain ways and to engage in pragmatically relevant actions from our interactions and observations of how others move and act. Bodies, and not just brains and minds, appear on either side of these interactive processes. In these relations, bodies are not cold reified objects, but affectively rich, living subjects without which we would have a difficult time explaining love, passion, desire, and the various drives that move us toward or away from one another.

More generally, phenomenology points to the importance of affect, in addition to the various sensorimotor contingencies normally emphasized by enactive accounts of perception (as in Noë, 2004). Any account of embodied (or enactive) cognition that focuses exclusively on sensorimotor components of perception or action, and ignores the realm of affect, provides an incomplete story since one also needs to account for motivational pull in one direction or another, or a sense of pertinent affective contingencies (Bower and Gallagher, 2013). Bodily affect significantly contributes to (either limiting or enabling) our contact with the world in our perceptually operative attentive outlook, in defining our perceptual interests, as well as in social perception. Affects are not restricted to the domain of phenomenal consciousness, although they may certainly have an effect on what experience feels like. Affects may or may not reach the threshold of conscious awareness. Consider the case of boredom (see Heidegger, 1995). Boredom is more than potentially related to action, in the case where we might try to overcome boredom. More importantly, boredom already modulates one's viewing or listening behavior, and it shows up in the way one arranges one's body, perhaps without even noticing, in a bored manner; or, in the way one begins to fidget, widen one's eyes, give vent to an exasperated breath, etc. Such bodily expressions are moments of the affective phenomenon of boredom – part of the pattern of boredom that can be observed in bodily behavior. In boredom one finds oneself immediately embodying a certain stance towards one's situation, a pull that resonates with and perhaps already prepares, any further course of action.

Affect is deeply embodied. Affective phenomena like fear, for example, have been shown to be determined by circulatory functioning – the heartbeat influences how and whether fear-inducing stimuli (images of fearful faces, in the reported experiments) are processed (Garfinkel, Minati, and Critchley, 2013). Fearful stimuli are more easily recognized when the heart contracts in a systole phase, and are perceived to be more fearful than when presented in a diastole phase. That is, the fact that we are flesh and blood creatures equipped with beating hearts, rather than brains in vats, explains in part why we have the experiences that we do. We could point to many other examples of how the affective condition of the body shapes cognition. For example, we perceive features of the world according to whether we are fatigued or carrying weight (see e.g. Proffitt, Stefanucci, Banton, and Epstein, 2003). Hunger can shape, and perhaps even distort, judgment and rational decision. For example, whether a judge is hungry or satiated may play an important role in her decisions about sentencing (Danziger, Levav, and Avnaim-Pesso, 2011). These empirical studies make explicit and provide scientific weight to what phenomenology discovers as affects and motivations implicit in pre-reflective experience.

In summary, phenomenology can point to a number of aspects of experience that demonstrate the embodied nature of cognition, including basic perceptual processes. The phenomenological analyses of movement and action, self-consciousness, intersubjectivity, and affect constitute only a limited number of issues in a broader range of embodied phenomena that are open to phenomenological investigation and confirmation in empirical scientific studies.

Note

- 1 Dreyfus was also influenced by his reading of Merleau-Ponty (e.g. Dreyfus, 2002). On a historical note, Aron Gurwitsch was also an important connection. Gurwitsch, influenced by both Husserl and Heidegger, and by his reading of Gestalt psychology, lectured in Paris in the 1930s (some of these lectures were attended by Merleau-Ponty) before arriving in the United States where he spent time on the faculty at Harvard and Brandeis and engaged in discussions with Samuel Todes. Todes produced a dissertation entitled *The Human Body as Material Subject of the World* at Harvard the year before Dreyfus finished his PhD there, and Dreyfus later organized the republication of Todes's dissertation as *Body and World* (2001).

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